Lecture organised by RAeS Hamburg Branch
Hamburg Aerospace Lecture Series
(DGLR, RAeS, VDI, ZAL, HAW Hamburg)
23.01.2020
HAW Hamburg (Hamburg University of Applied Sciences)

Airbus BelugaXL

Veronique Roca – Beluga XL Chief Engineer

AIRBUS

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Hamburg Aerospace Lecture Series
Hamburger Luft- und Raumfahrtvorträge

HAW HAMBURG

RAeS Hamburg in cooperation with the DGLR, VDI, ZAL & HAW invites you to a lecture

Beluga XL - Oversize Transport for the 21st century

Veronique Roca, Airbus BelugaXL Technical Director & Chief Engineer, Airbus Operations

Date: Thursday 23 January 2020, 18:00
Location: HAW Hamburg Berliner Tor 5, (Neubau), Hörsaal 01.11

Lecture followed by discussion
No registration required !
Entry free !

Featuring one of the most voluminous cargo holds of any civil or military aircraft flying today, the Airbus Beluga plays a key role in keeping Airbus production and assembly network operating at full capacity. The current fleet of 5 Beluga, based on A300-600, carries complete sections of Airbus aircraft from different production sites around Europe to the final assembly lines in Toulouse, France and Hamburg, Germany.

To support the A350 XWB ramp-up and other production rate increases, Airbus will gradually replace its current Beluga's with six BelugaXL aircraft, derived from the company's versatile A330 widebody product line. Veronique Roca, Chief Engineer of the BelugaXL, will tell us about the BelugaXL since its launch in Nov 2014: with the First Flight in July 2018, the BelugaXL is now completing the Flight Test Campaign and has recently achieved certification.

Veronique has been BelugaXL Technical Director & Chief Engineer since 2016. As part of her mission she holds the Technical Authority to define and validate the target configuration of the aircraft, in line with operational and certification requirements, and meeting highest safety standards. Previously, Veronique was A330 Chief Engineer for France for two years.

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DGLR Bezirksgruppe Hamburg http://hamburg.dglr.de
RAeS Hamburg Branch http://www.raes-hamburg.de
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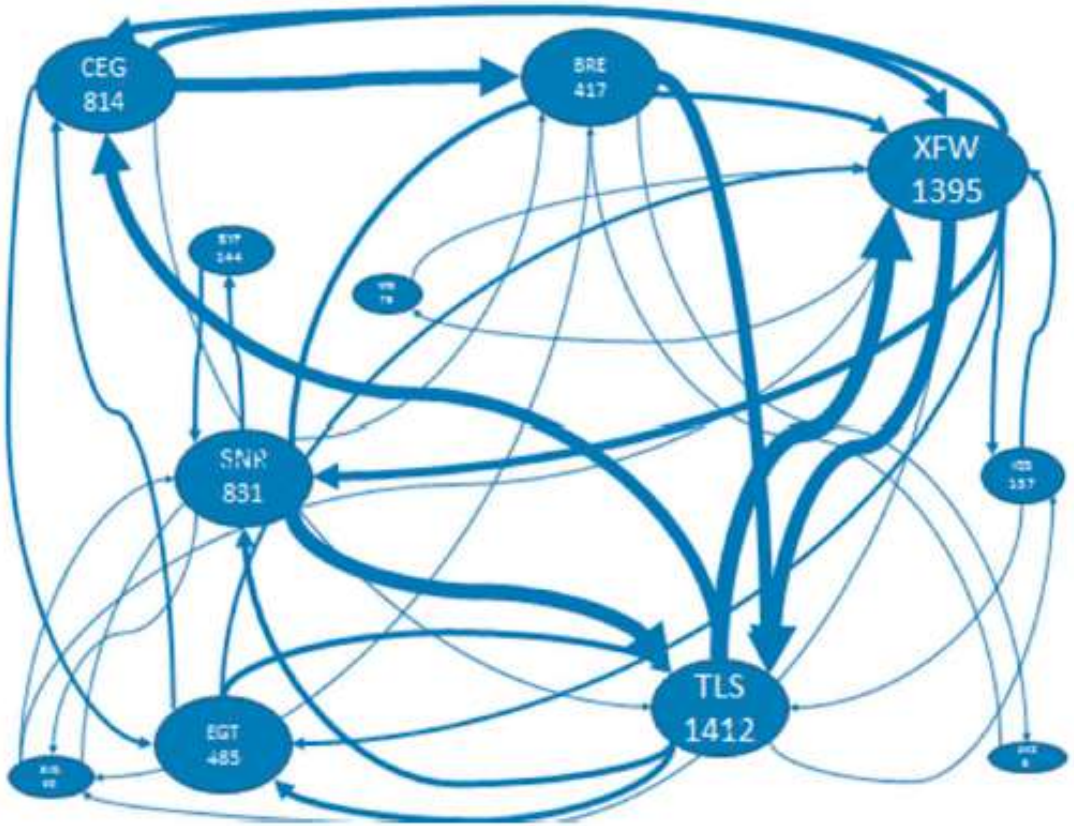
http://www.AeroLectures.de/

The Beluga's: a family portrait.

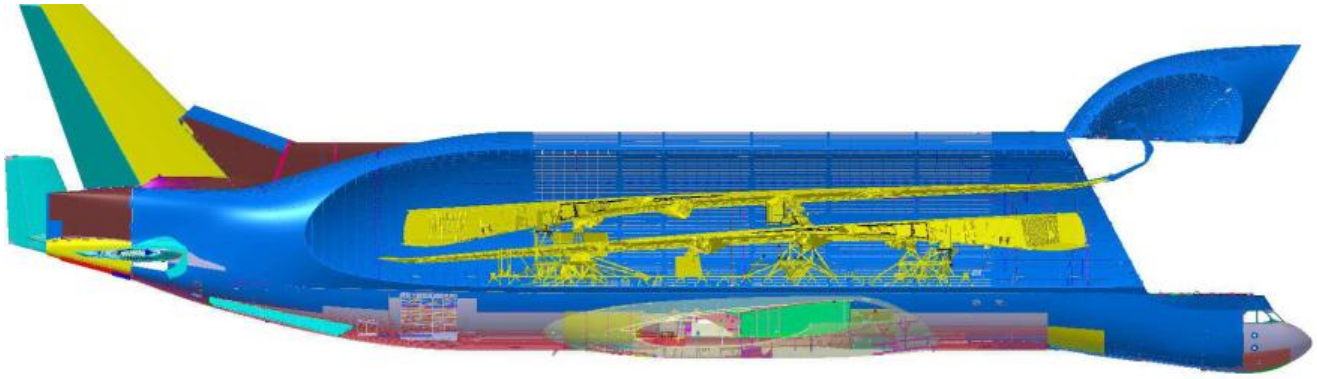
Oversize Air Transport – End to End solution for Airbus production

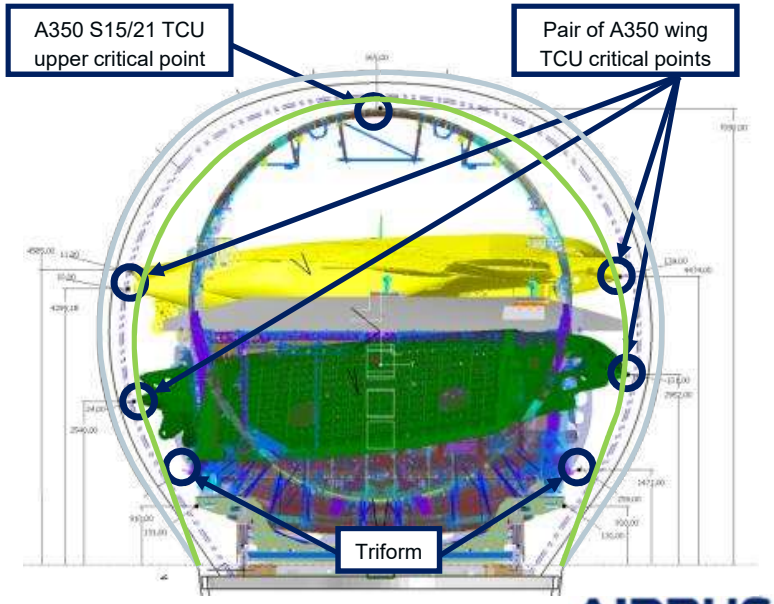


Why a Beluga XL?

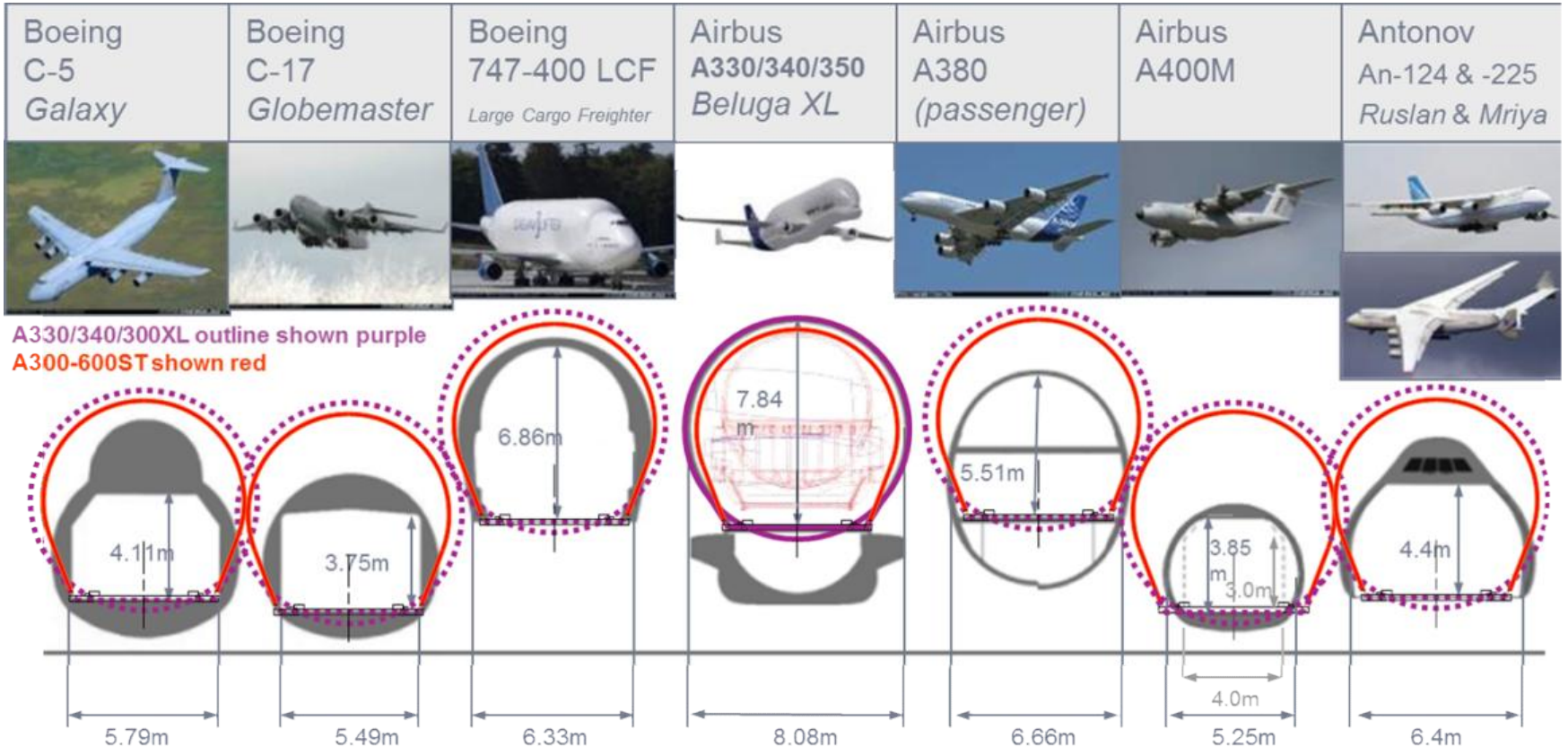
Today: 5 Beluga ST, operated at their maximum
Increased production rates through time
Higher transport requirements: with A320 : ref, A330 : x3, A350 : x7

Road and sea transport less flexible





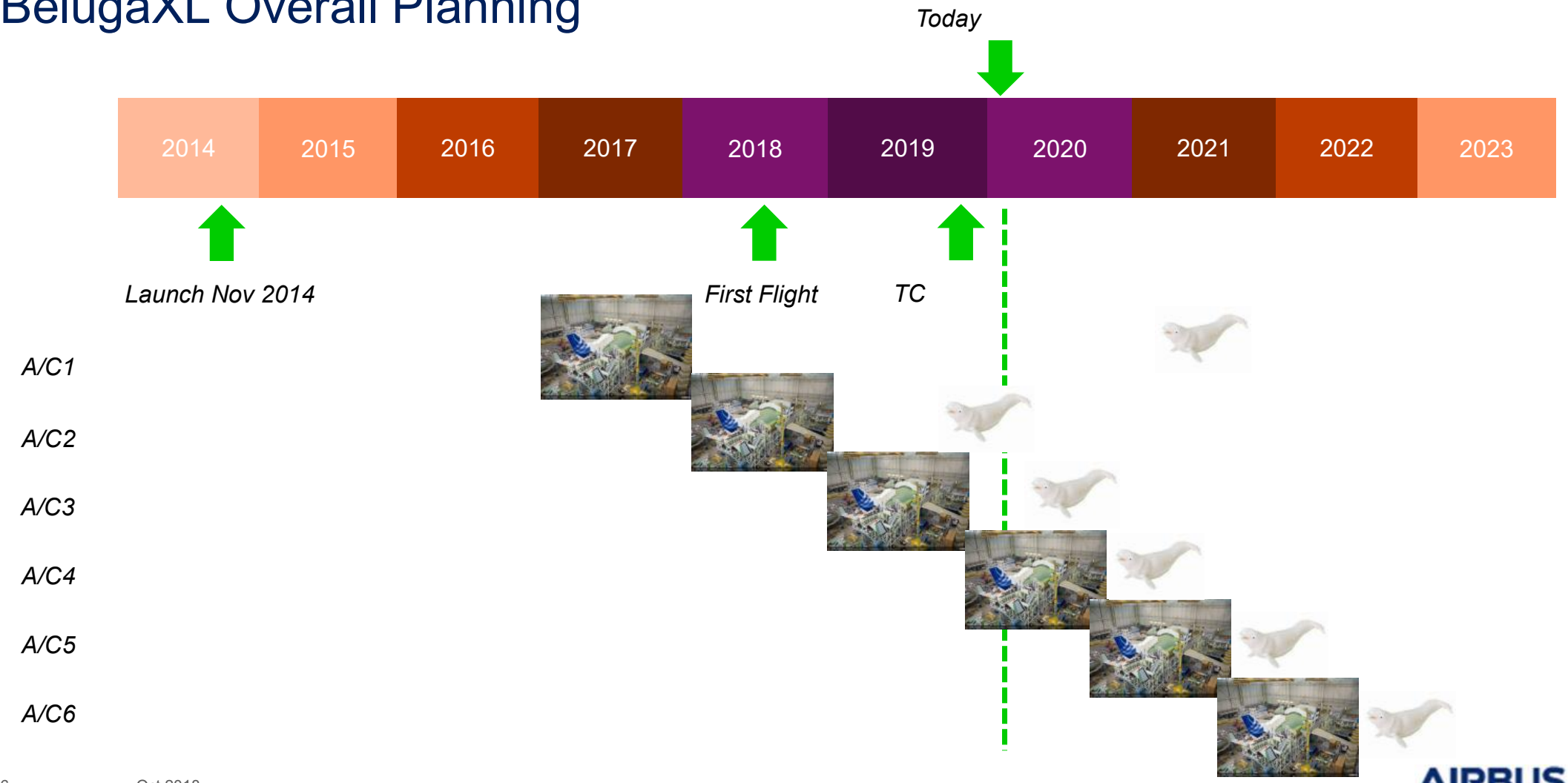
Why a BelugaXL ?



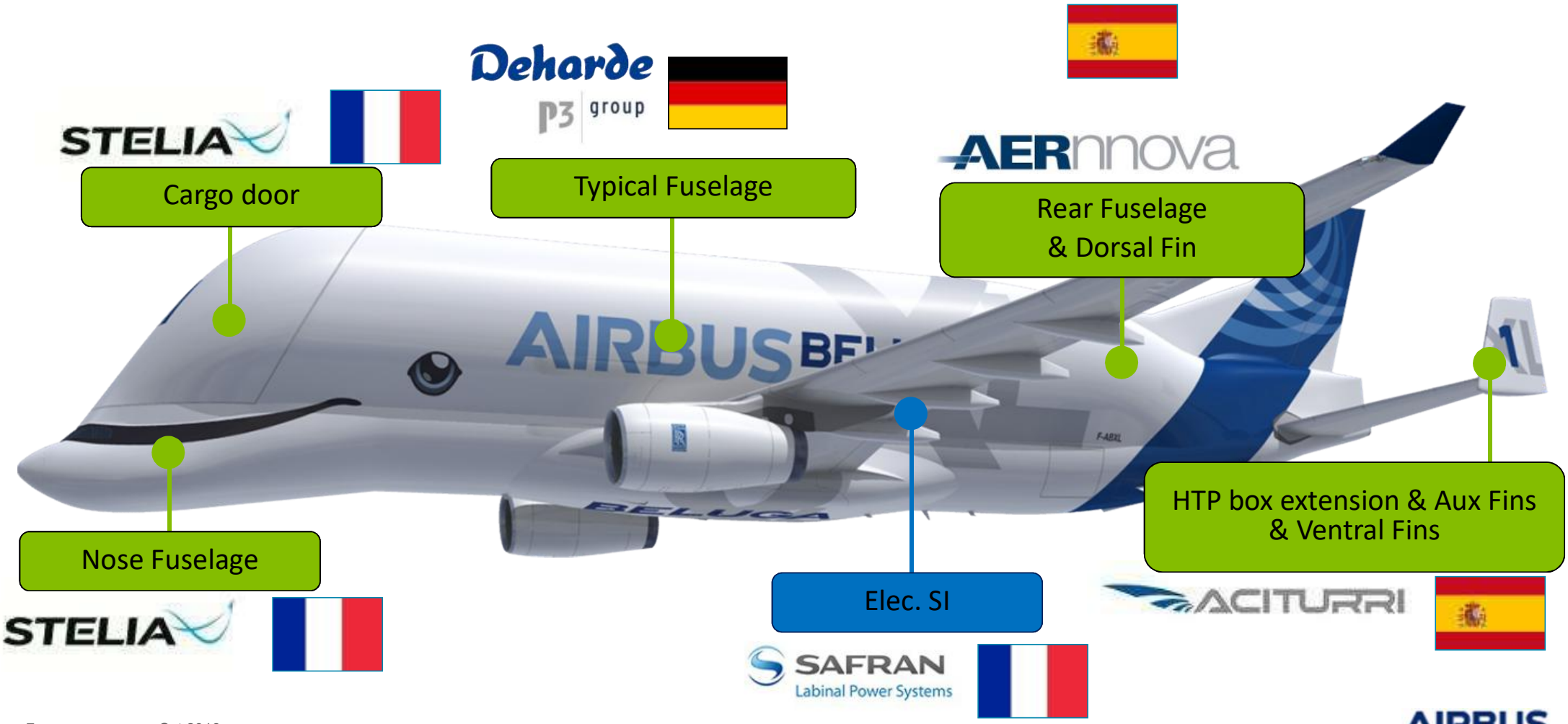
Ground line: Note: some aircraft all have "kneeling" landing gear. Position above ground line approximates to the high/ un-kneeling position.

Max payloads	122.5 t	77.5 t	59 t	50+t	n/a	37 t	An-124: 150 t An-225: 250 t

BelugaXL Overall Planning



A Team work - Major Structure & SI Suppliers



A Team work - Major Equipment / Systems Suppliers

Cargo Loading System equipment

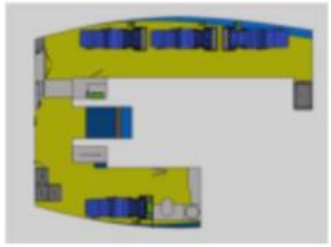
Telair INTERNATIONAL

Cargo Door Actuation System

Triumph Group, Inc.

Engines

Courier Area



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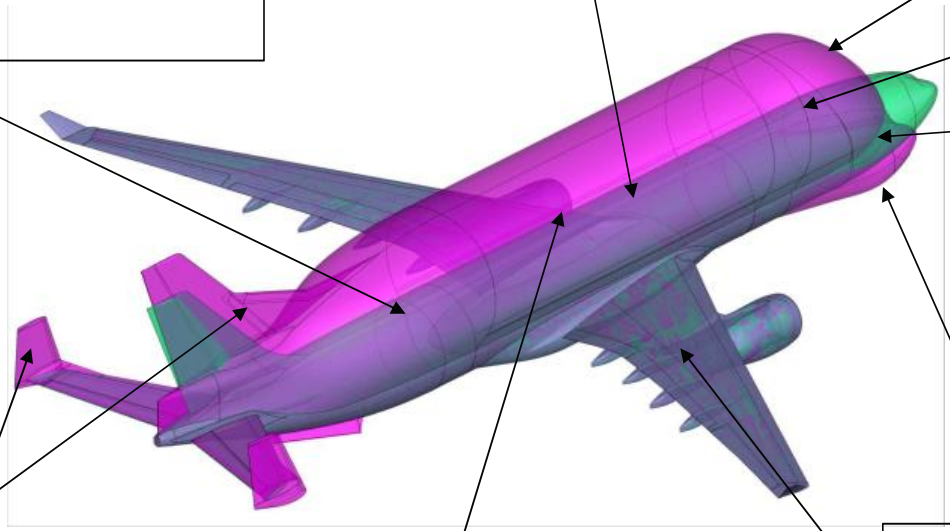
Door Control Monitoring System

CRANE

From an A330 to a BelugaXL



Main Deck Cargo Door
And other access doors

Cargo Loading System

A330-200 front fuselage, A330-300 rear fuselage for overall centre of gravity optimisation

Flight Control Laws

Air Conditioning adaptations

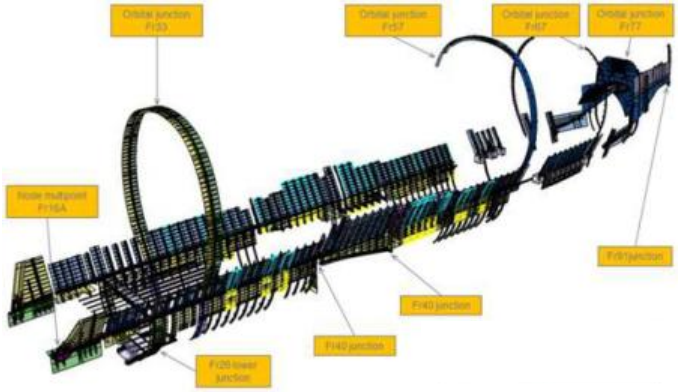
Lowered cockpit to accomodate for loading zone

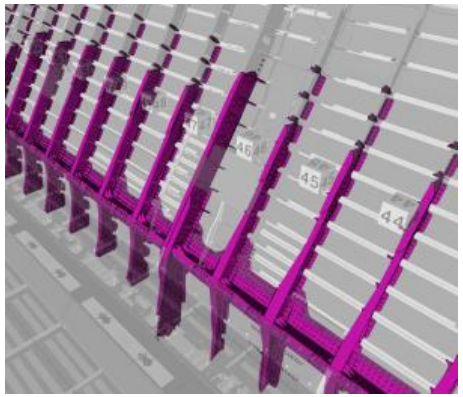
Additional fins for lateral stability, A330 VTP raised by ~2m

New cross-section allowing +150% volume vs A330

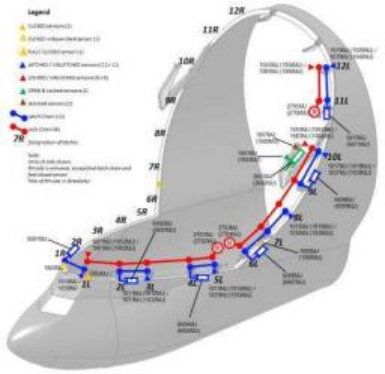
Same A330 wing, pylons and engines
Many re-use equipment including Landing Gears

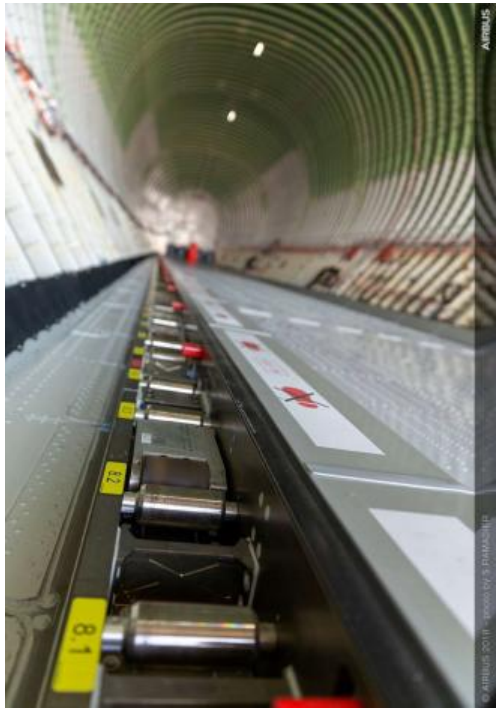
From an A330 to a BelugaXL





Design in Full 3D of the junction between A330 and new upper fuselage





Main cargo door and cargo loading system concepts similar to Beluga ST designed for compatibility with existing infrastructures

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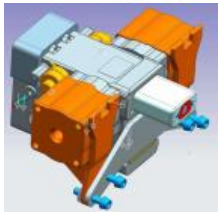
Power Drive Unit

Power Lock Unit



TCU Sensor

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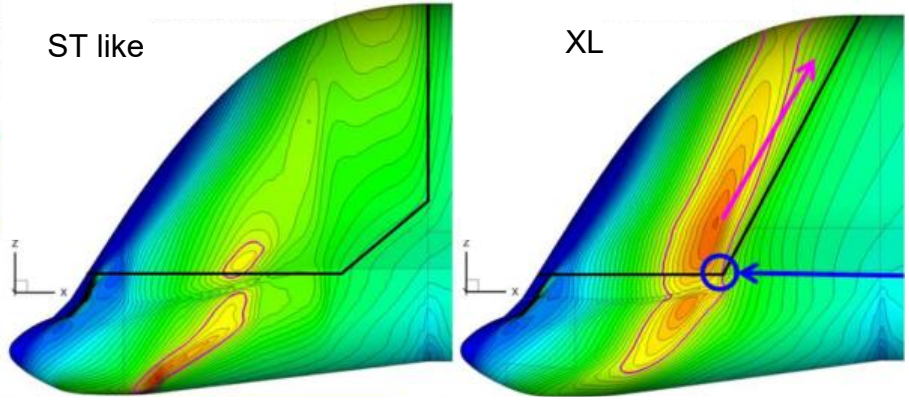
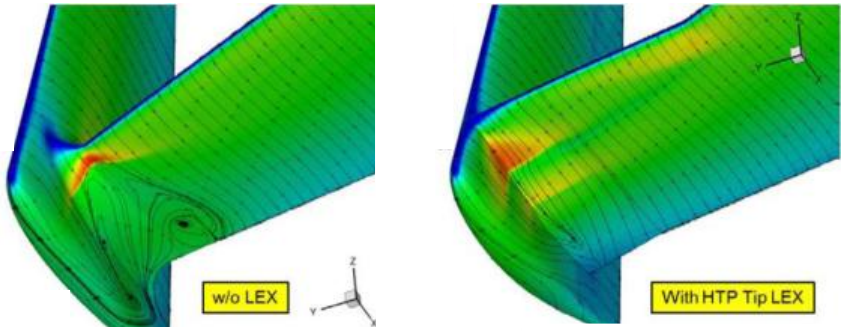
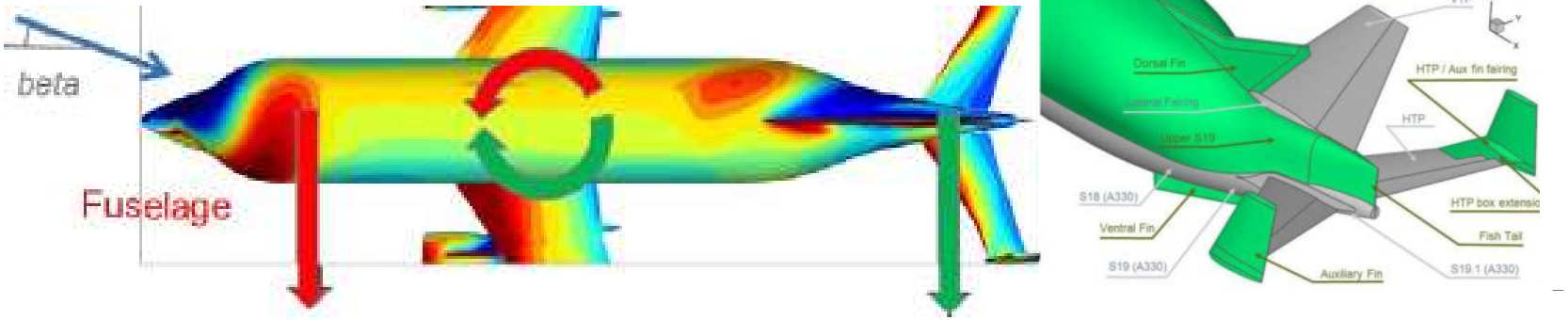
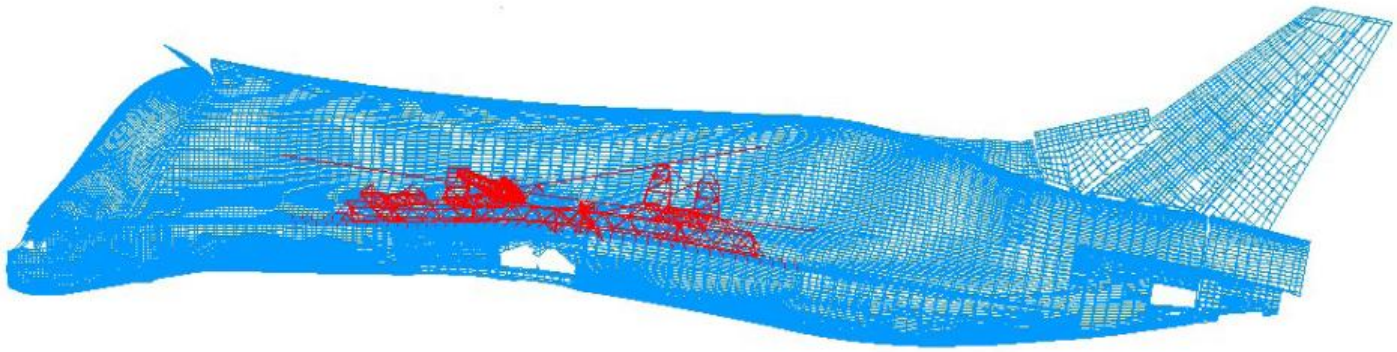
Challenges: configuration

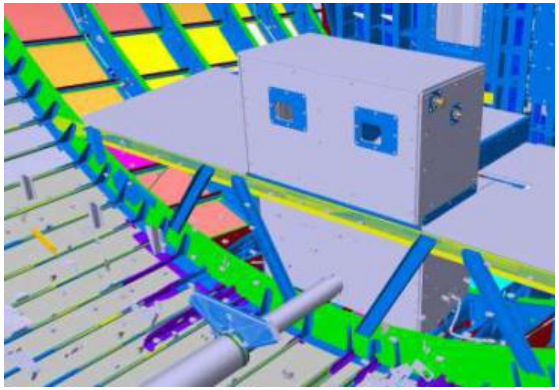






Challenges: structure





End 2016, the A330 platform is ready for 1 year of integration

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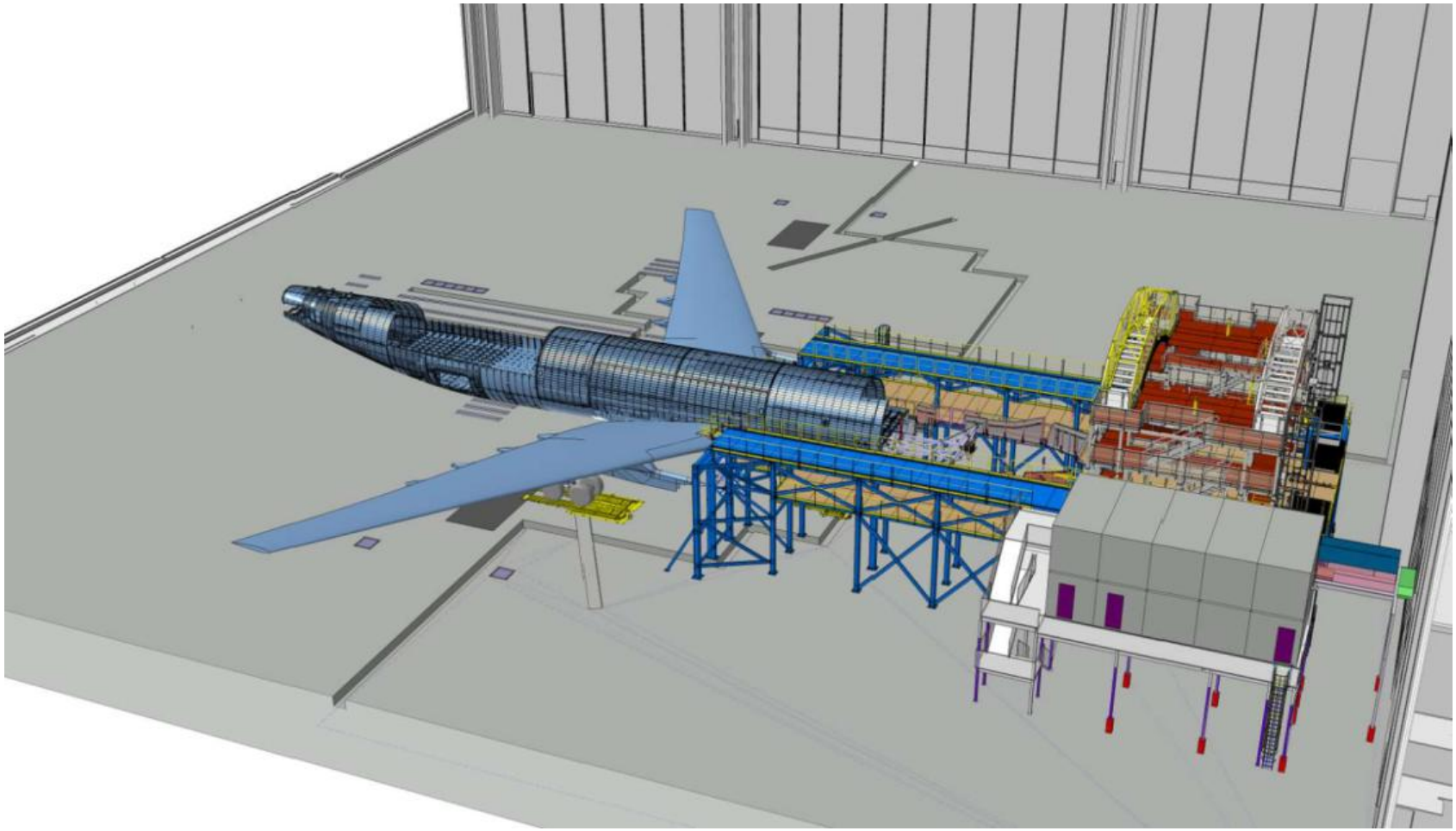
FAL assembly build process - moulding operations



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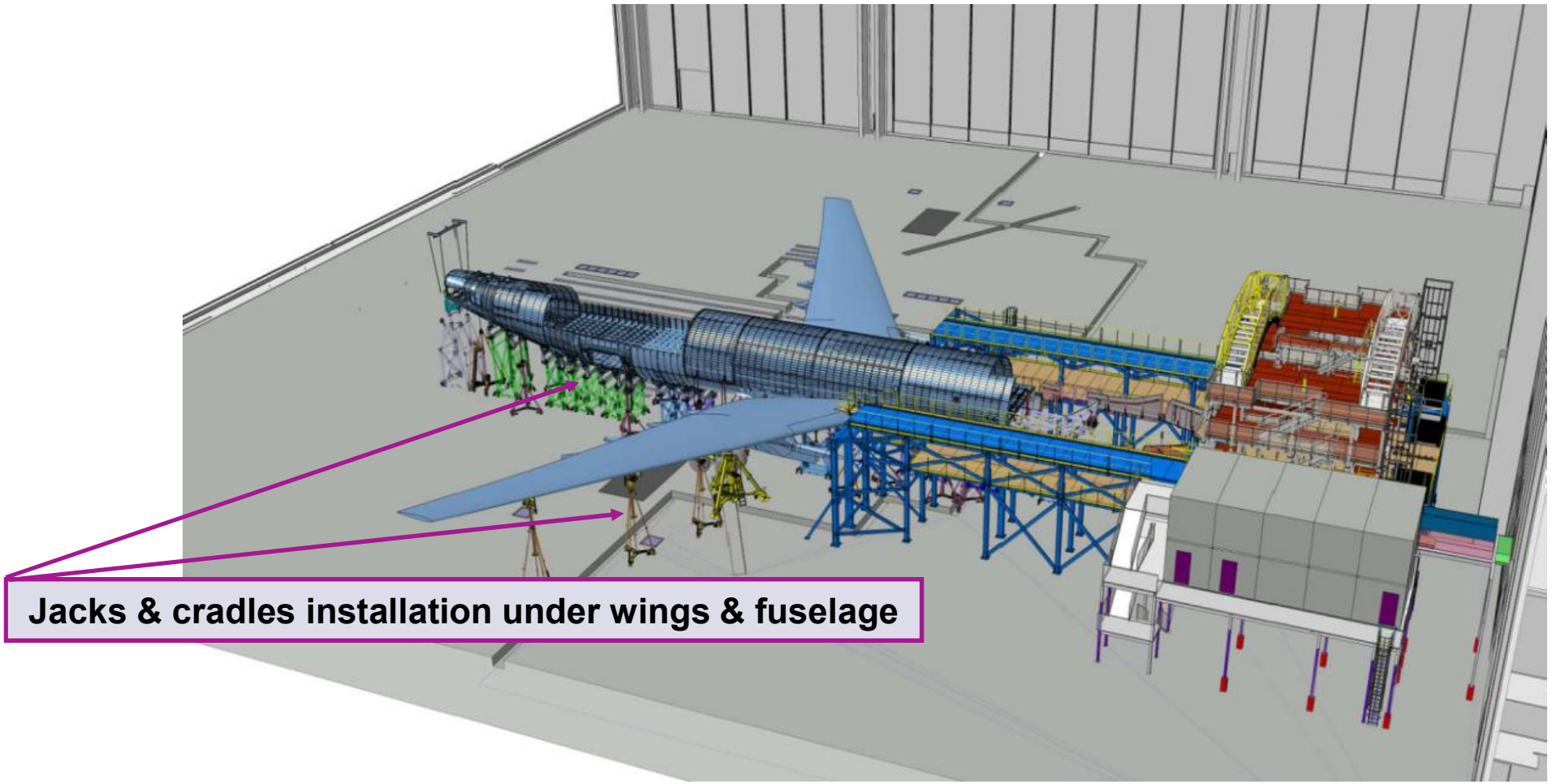
FAL assembly build process - jacking operations



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16th of Jan 2017: housewarming party of conversion hangar

Cutting of A330 upper fuselage

Preparation of the Junction, Installation of rails

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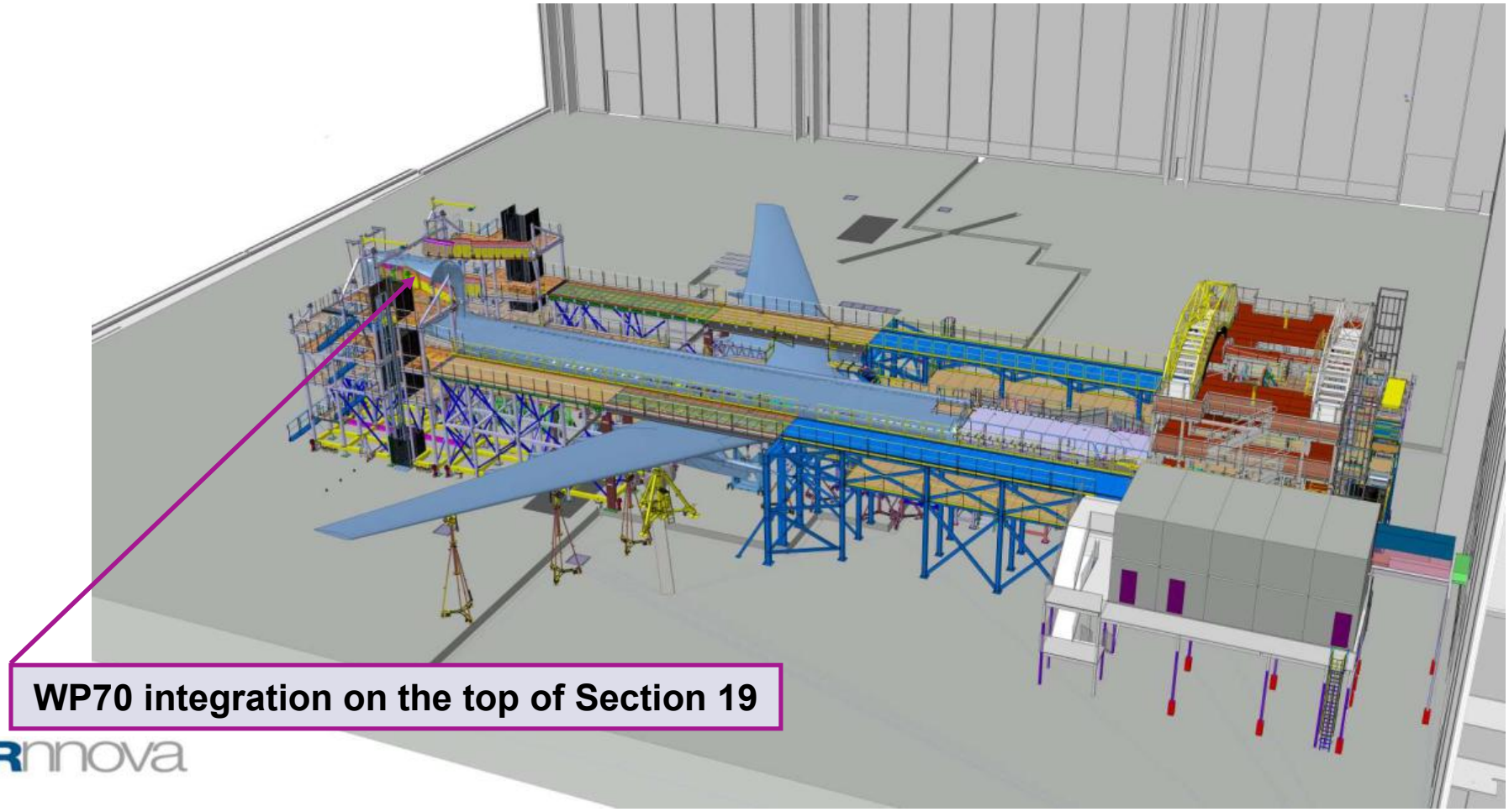
FAL assembly build process – Fin Insert integration on Section 19



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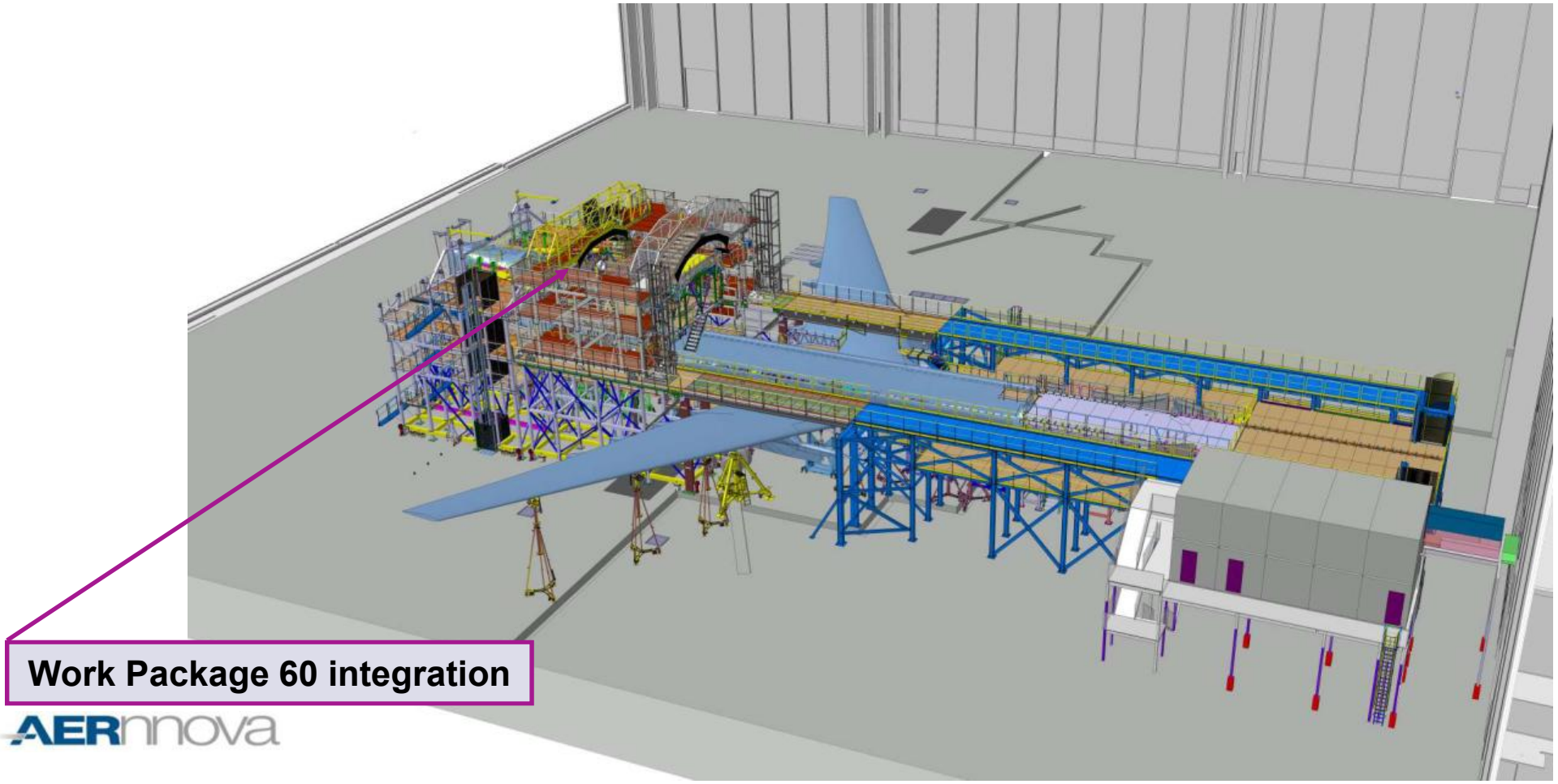
FAL assembly build process – Rear Fuselage integration



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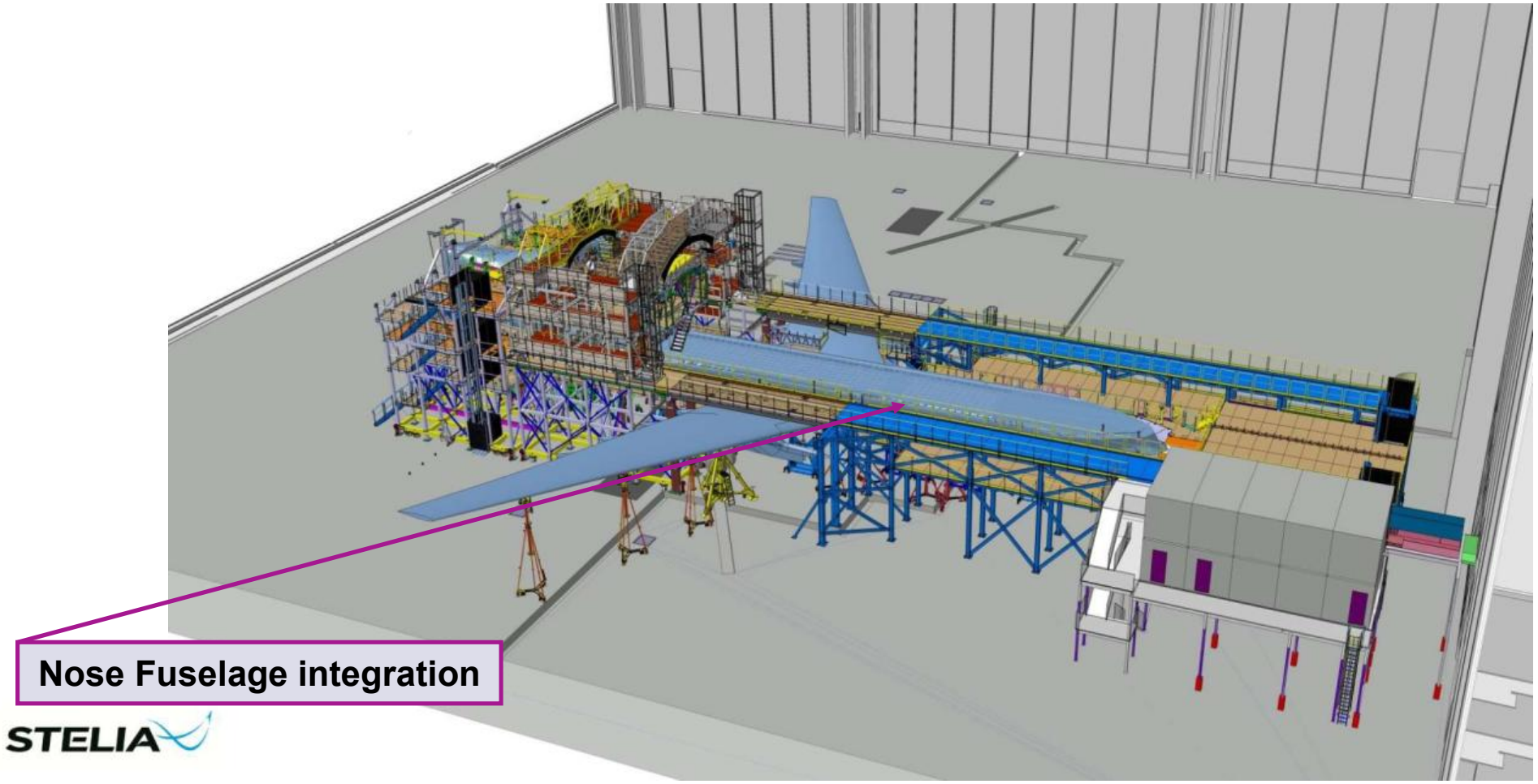
FAL assembly build process – New Nose Fuselage integration



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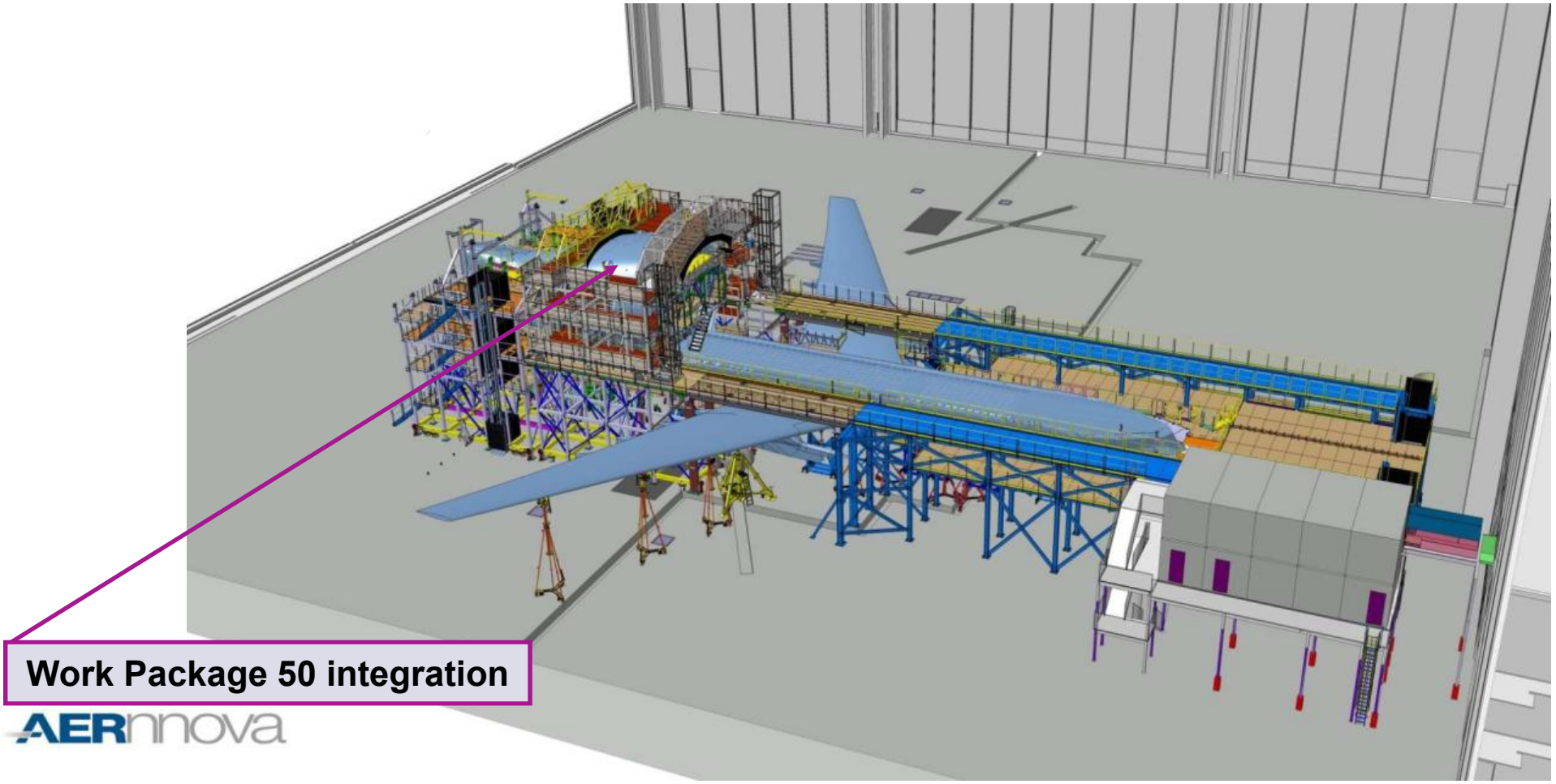
FAL assembly build process – Rear Fuselage integration



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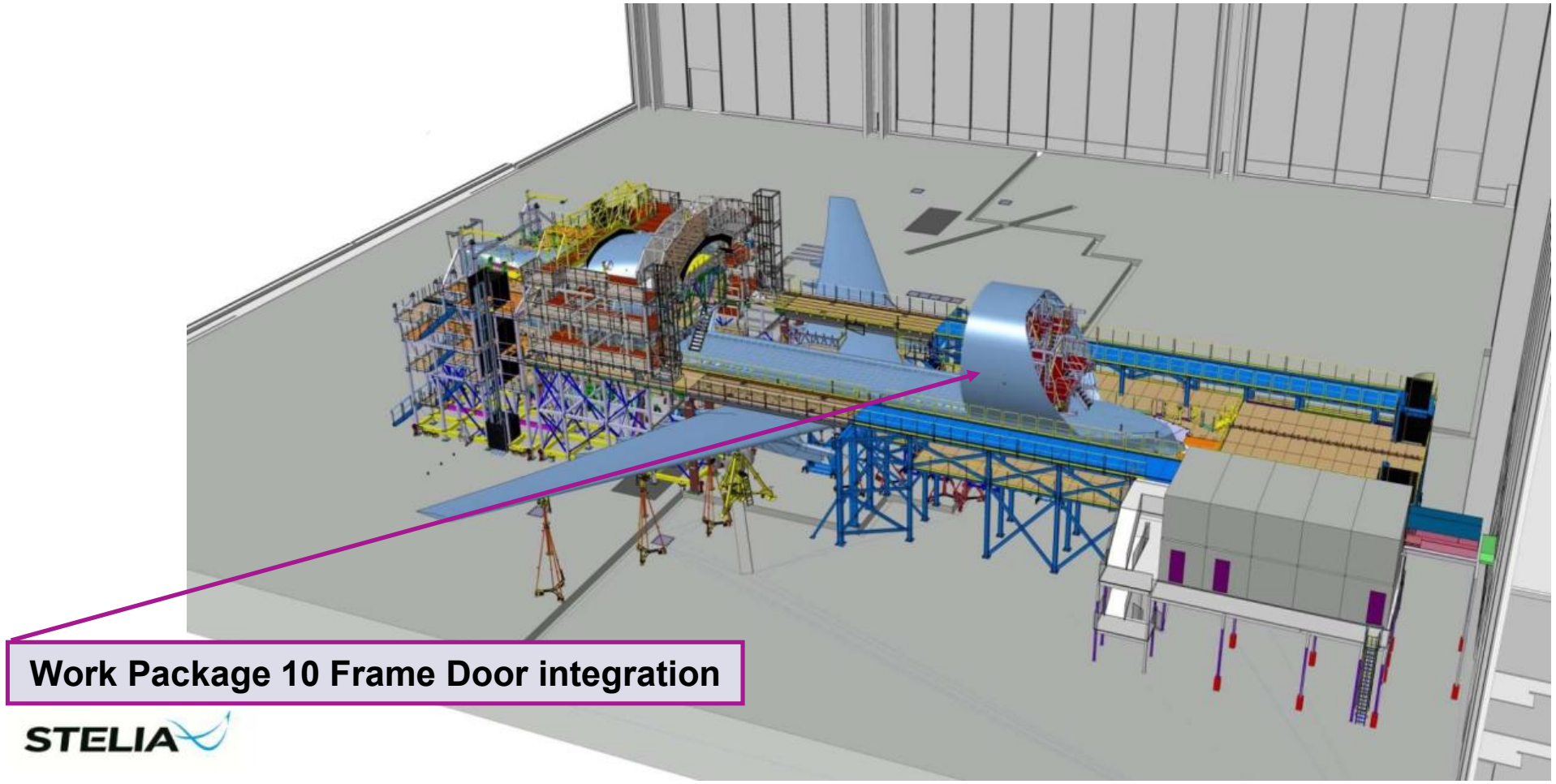
FAL assembly build process – Door Frame integration



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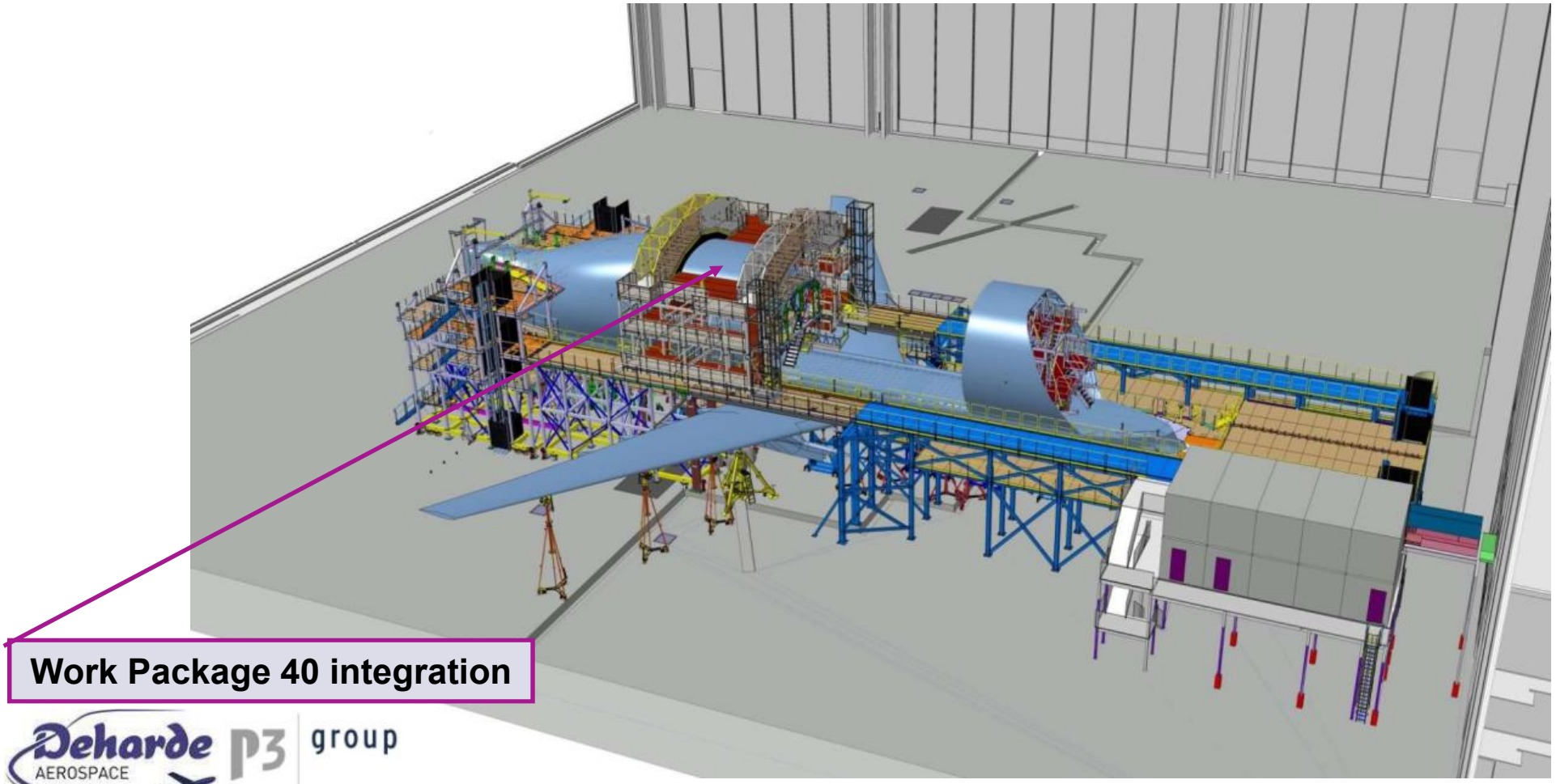
FAL assembly build process – Central Fuselage integration



Deharde AEROSPACE p3 group

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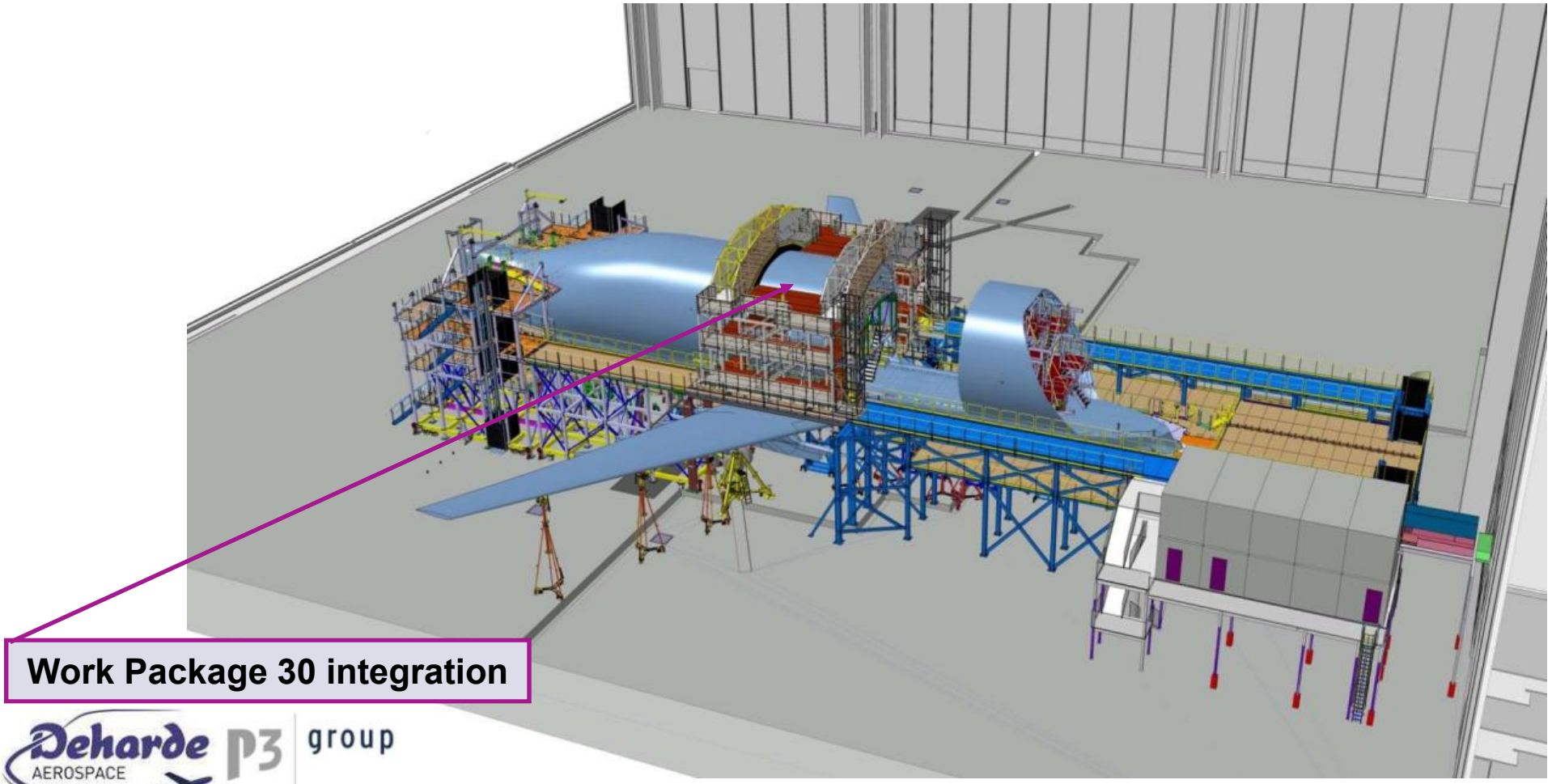
FAL assembly build process – Central Fuselage integration



Deharde AEROSPACE p3 group

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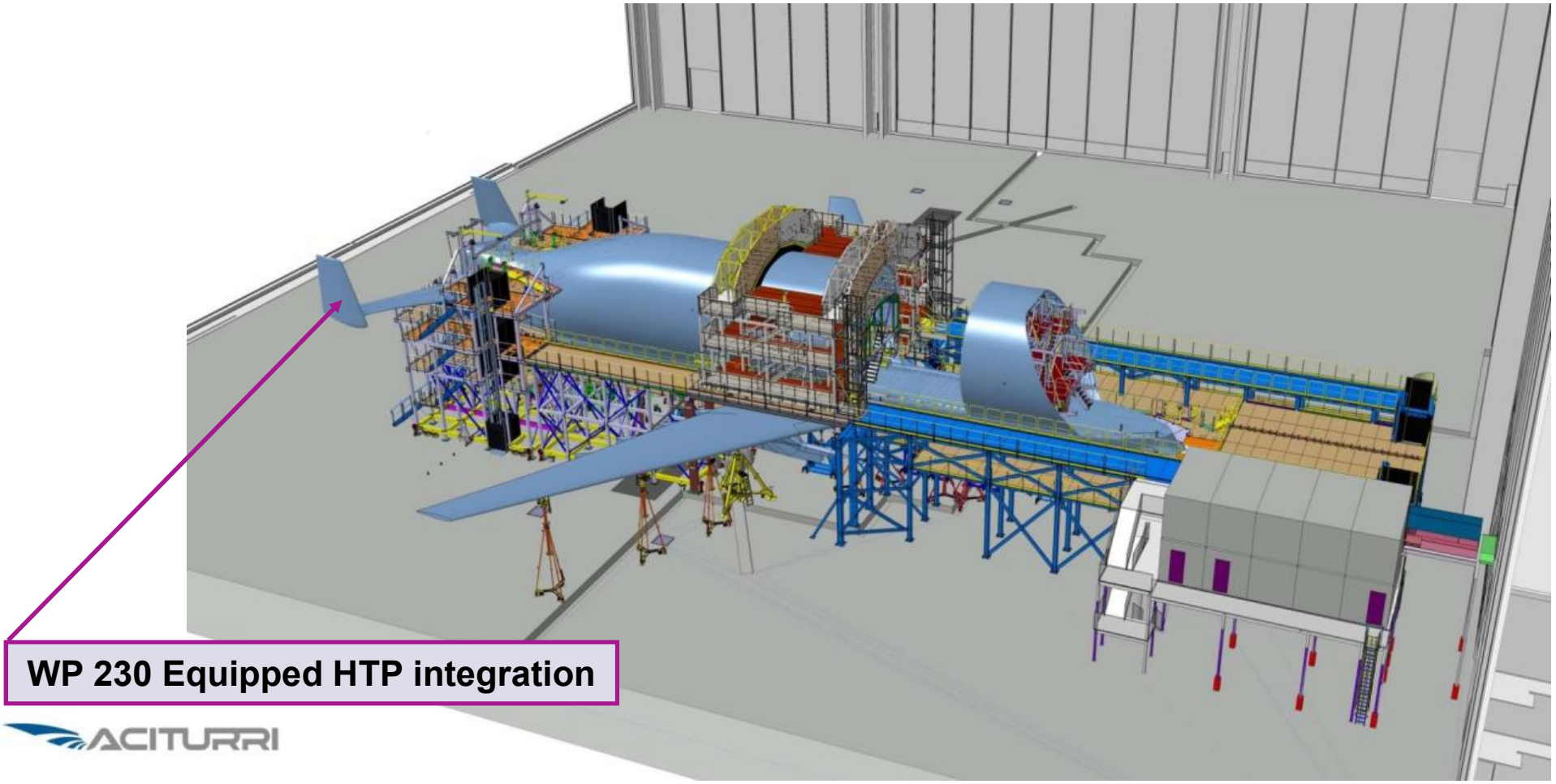
FAL assembly build process – Equipped HTP integration



ACITURRI

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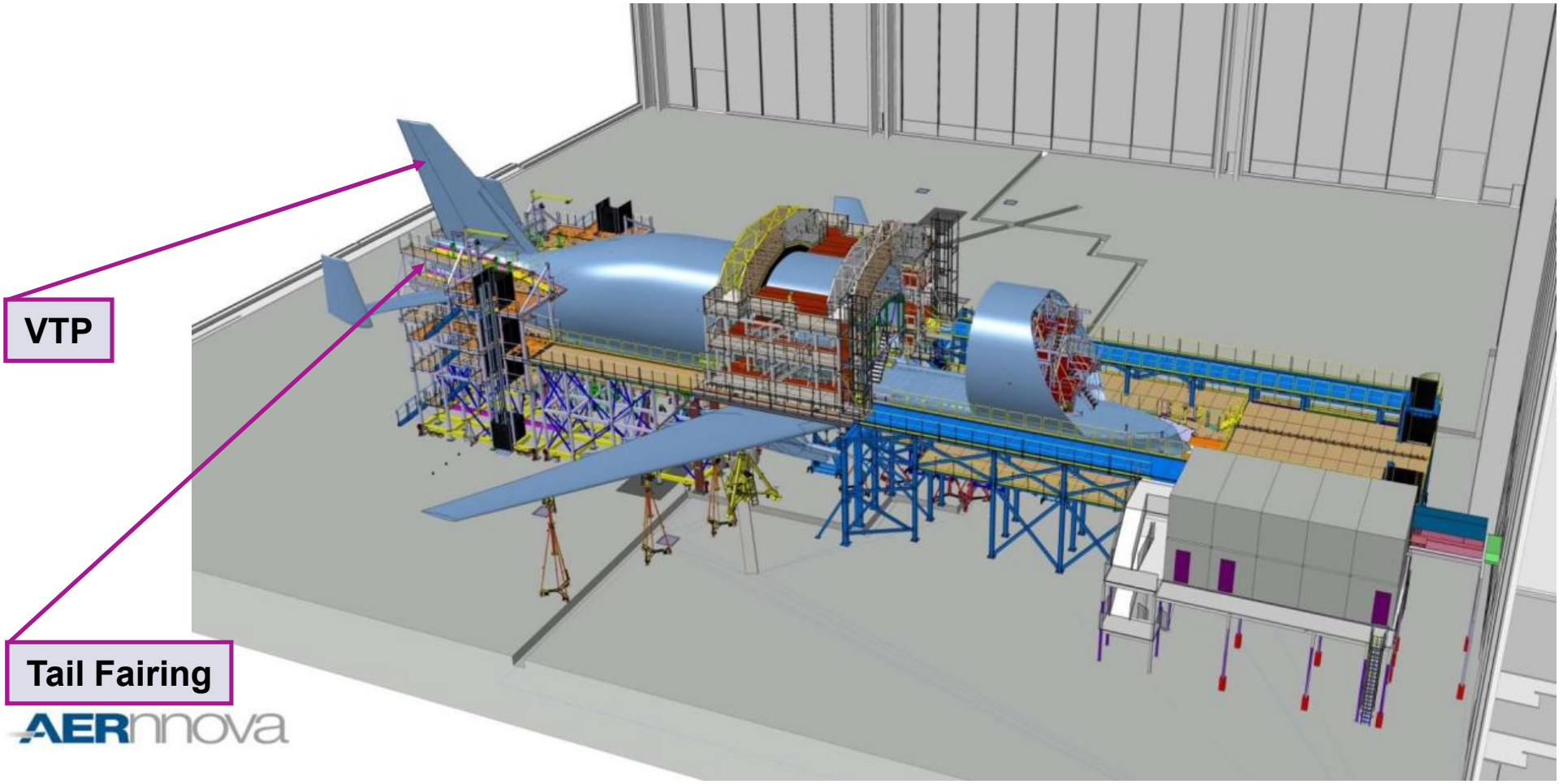
FAL assembly build process – Tail Fairing & VTP



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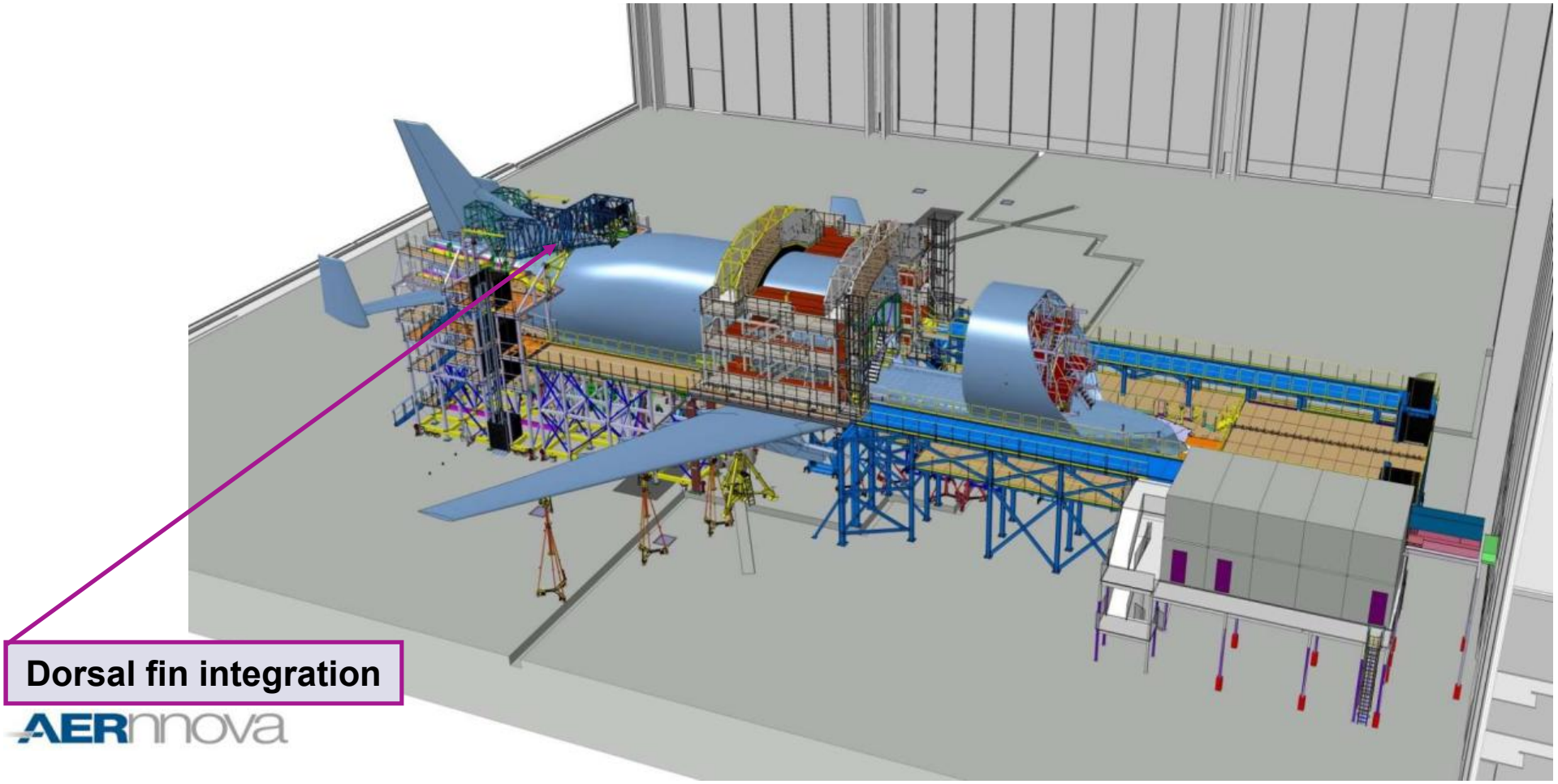
FAL assembly build process - Dorsal fin integration



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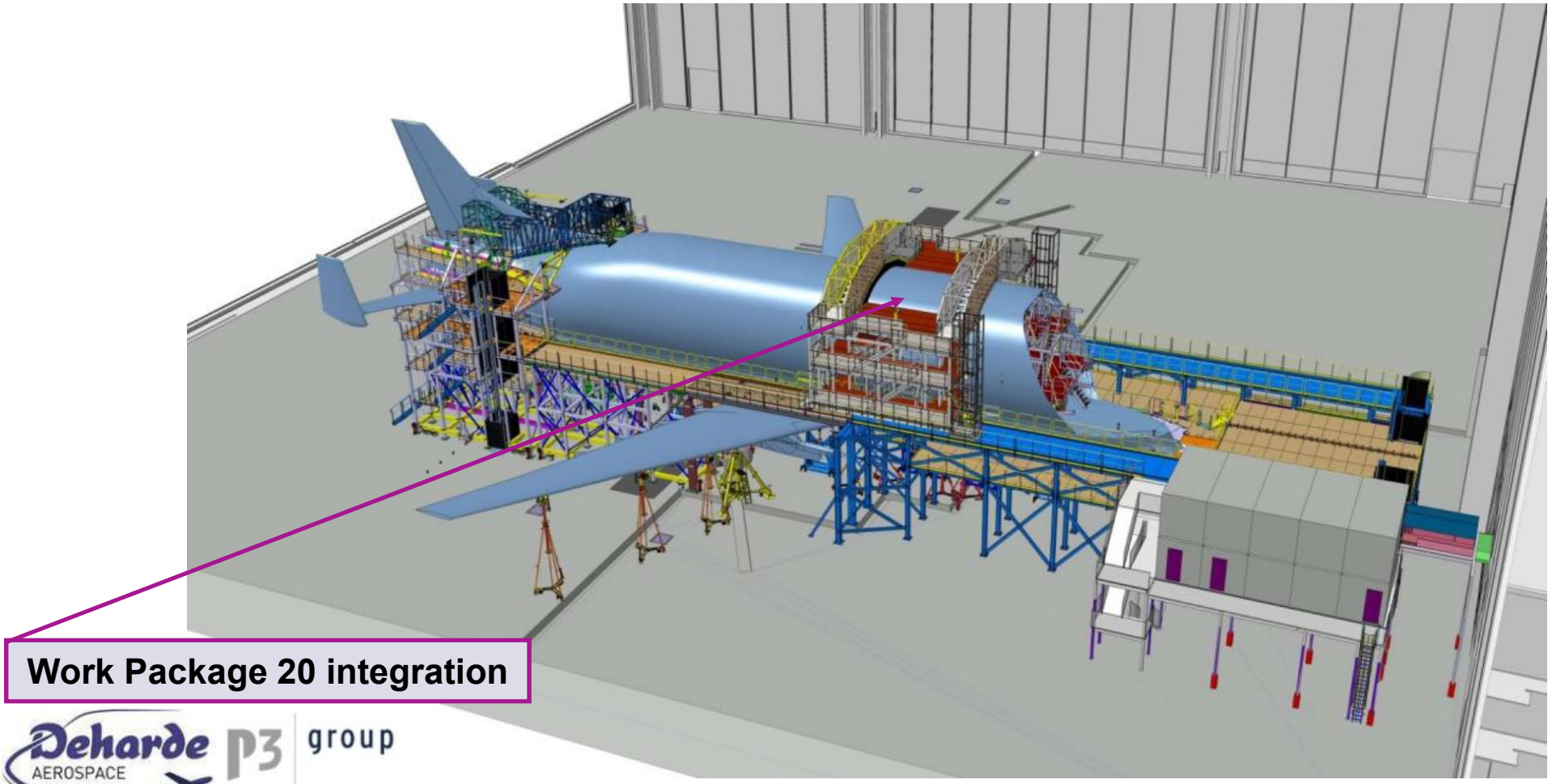
FAL assembly build process – Last fuselage section integration



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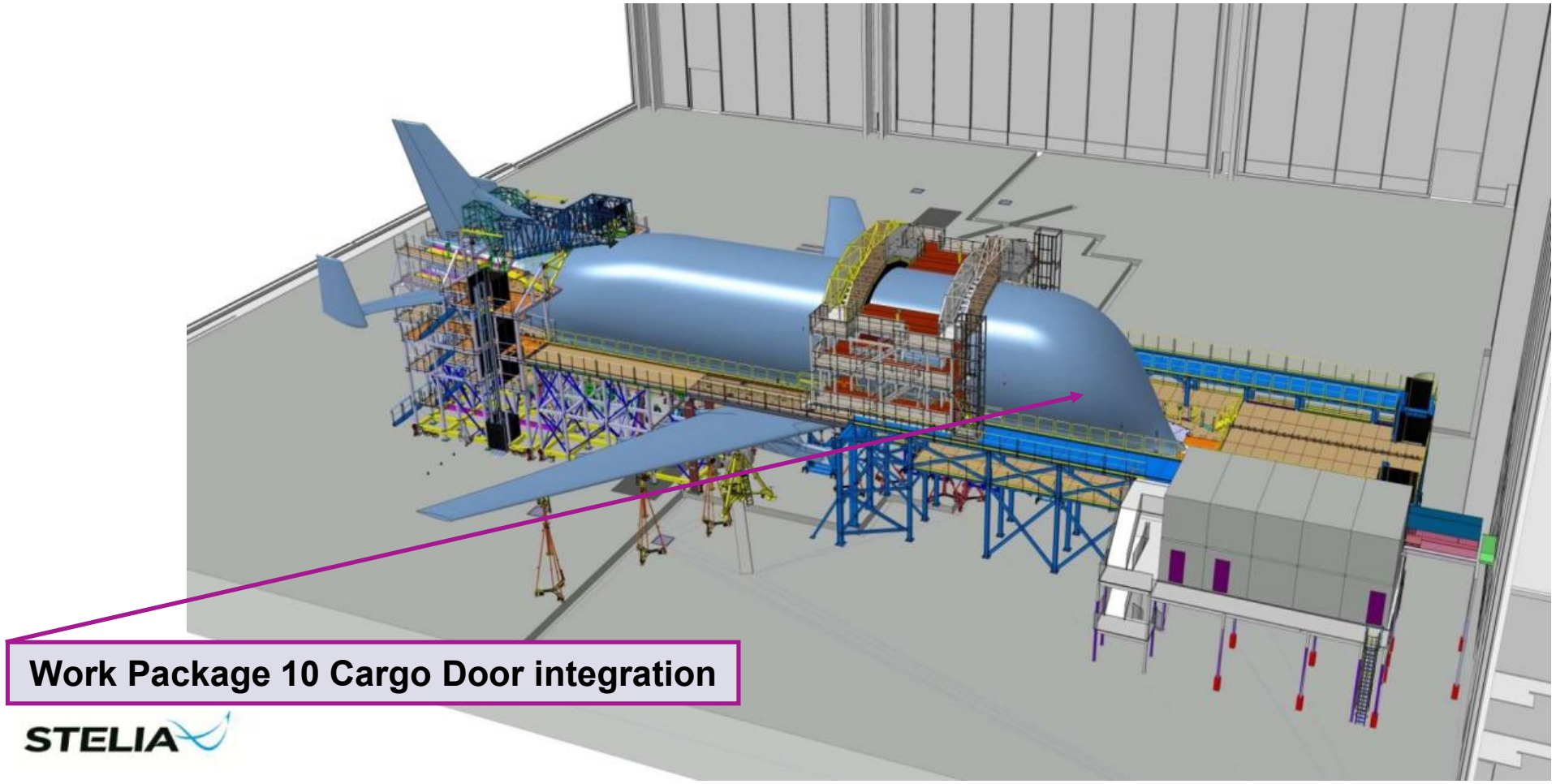
FAL assembly build process – Main Deck Cargo Door integration



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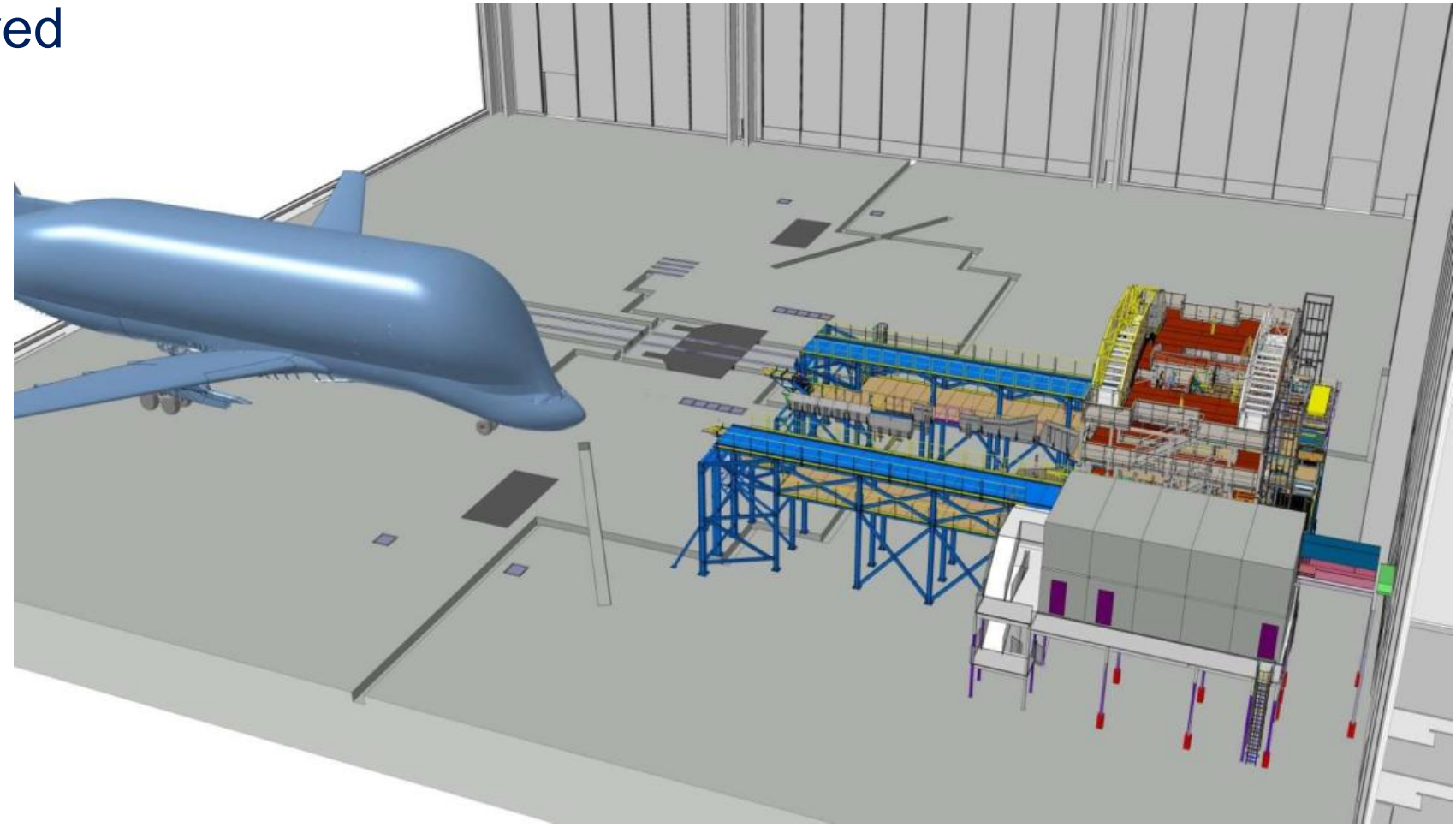
FAL assembly build process – A/C on wheels, all platforms & accesses removed



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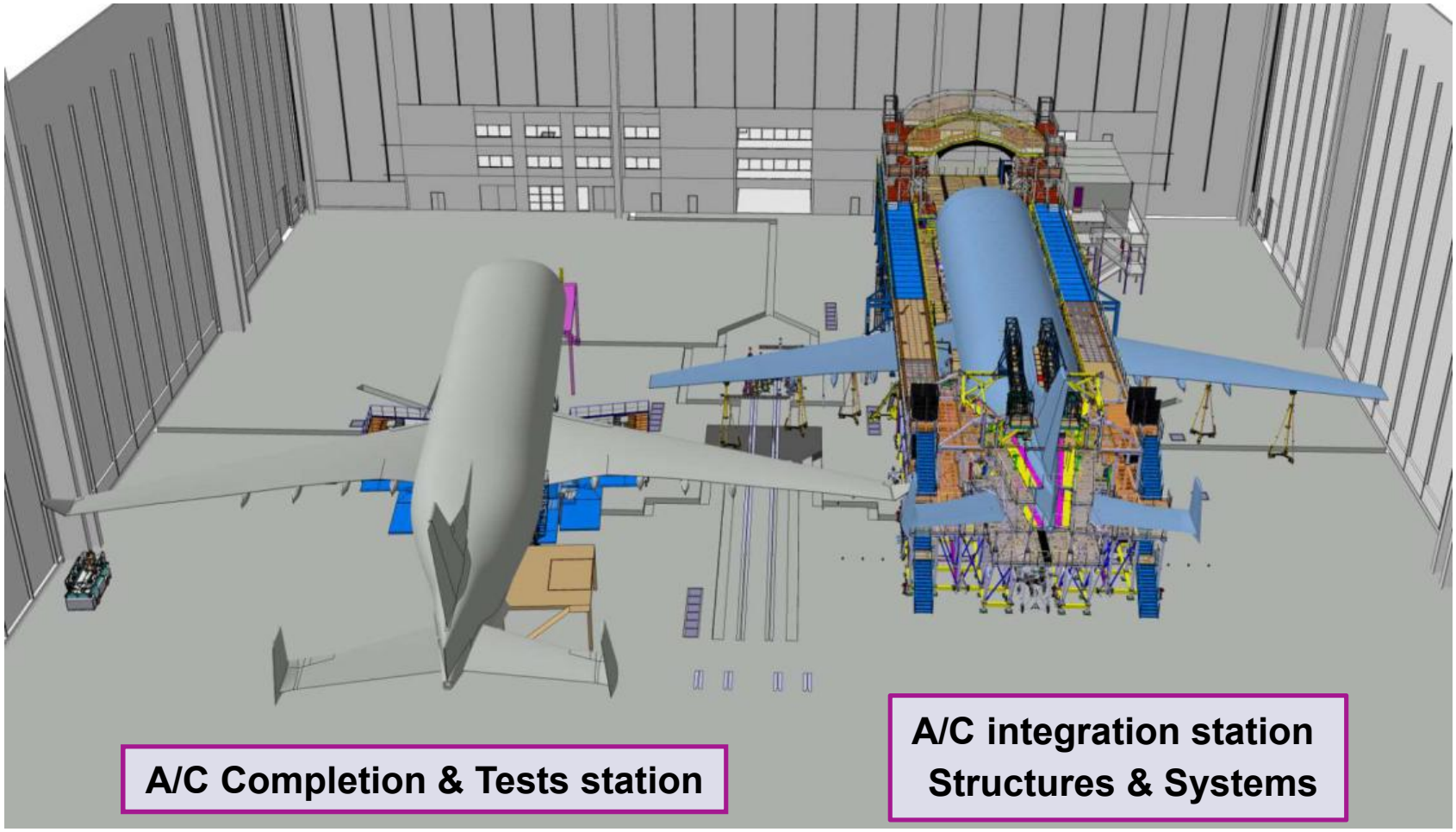
FAL assembly build process - Stations organisation



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January 2018 - Aircraft moves

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End 2017/ Beg 2018: A/C 1 Power On & Roll out

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Dedicated Aircraft 1 testing prior First Flight: aircraft weighing

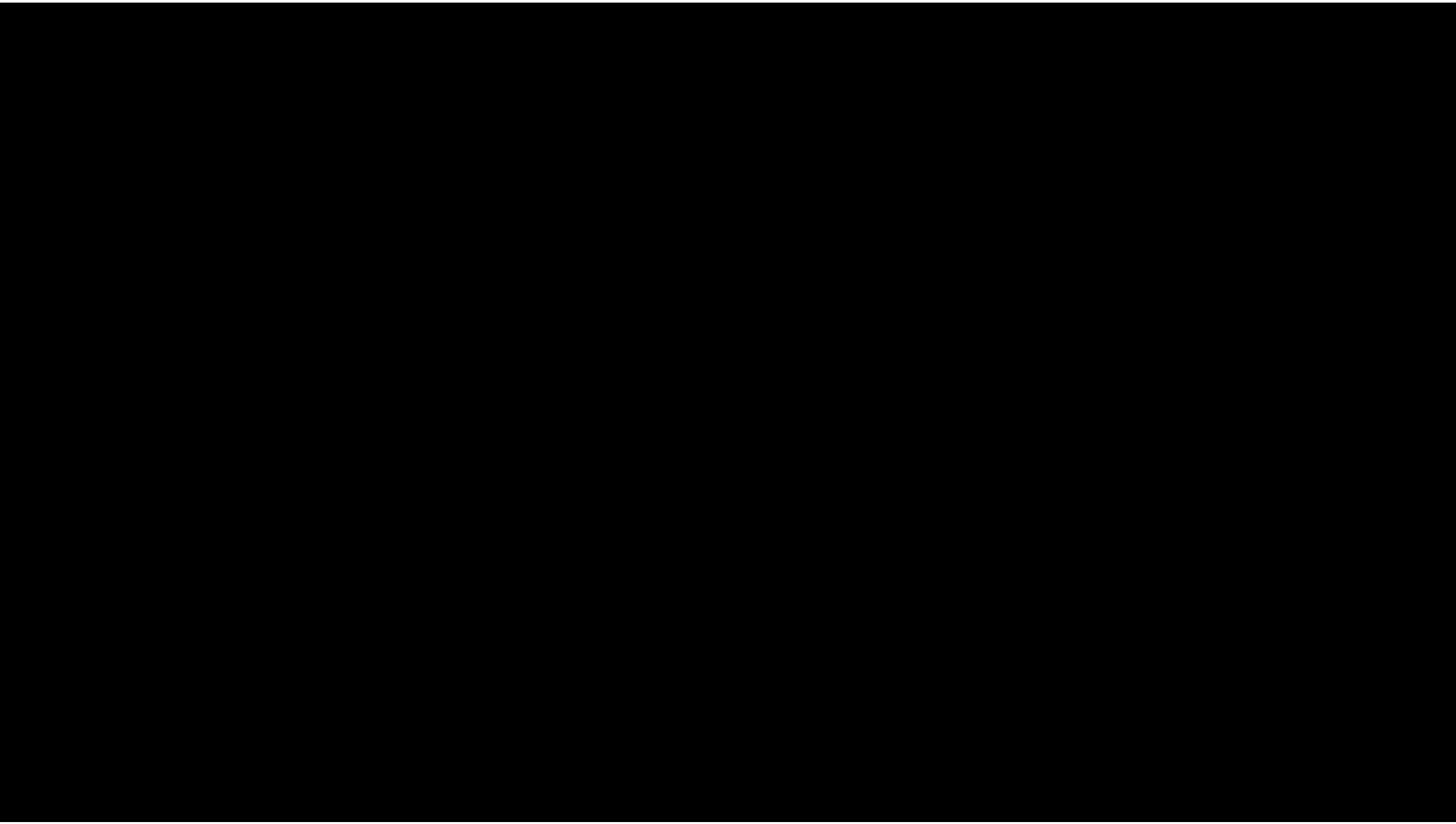
Dedicated Aircraft 1 testing prior First Flight: GFEM validation

Dedicated Aircraft 1 testing prior First Flight: Ground Vibration Tests

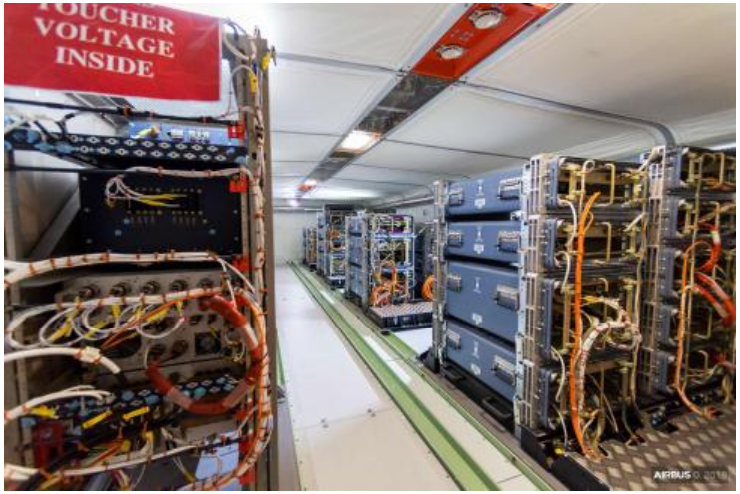
Dedicated Aircraft 1 testing prior First Flight: Cargo Loading Trials

2 weeks of painting end of June 2018

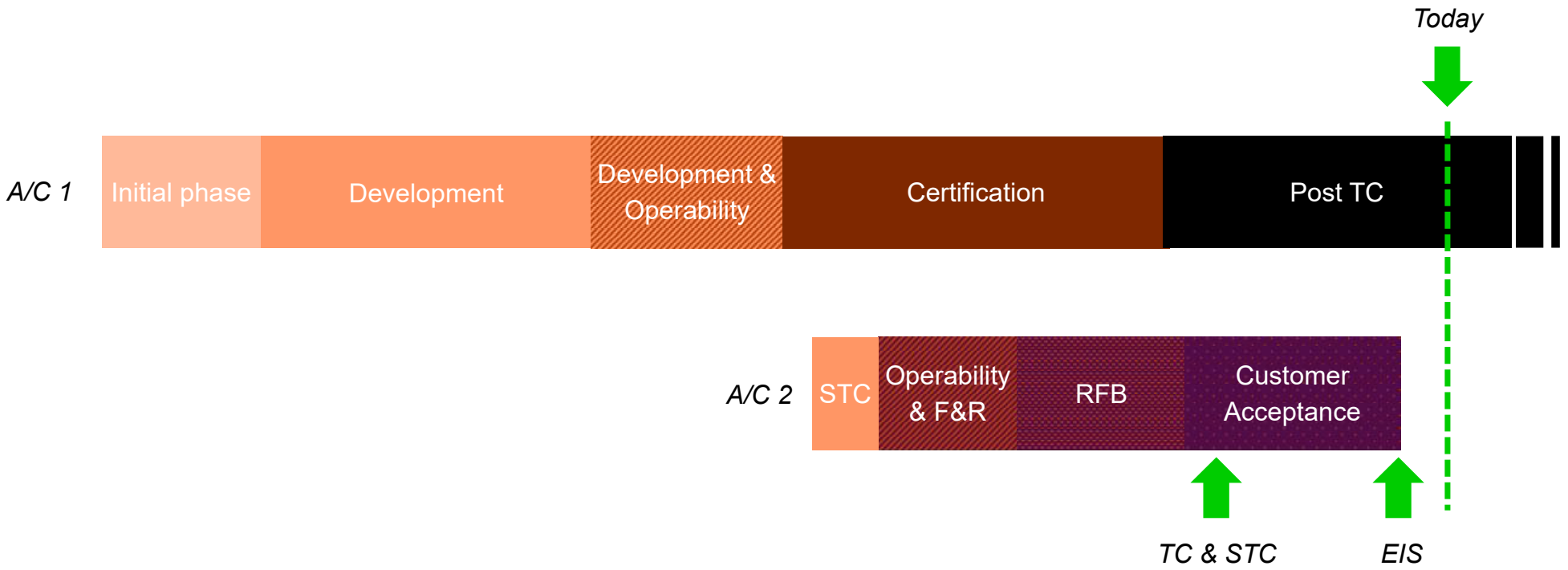
19th of July 2018: First Flight



Flight Test Installation: some particularities



Flight Test campaign towards certification S2 19



TC & STC on 11th of November 2019

EASA

TYPE CERTIFICATE

EASA.A.004

AIRBUS S.A.S.

2 RONDPOINT EMILE DEWOITINE
31700 BLAGNAC
FRANCE

EASA

MAJOR CHANGE APPROVAL

10071604

AIRBUS S.A.S.

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FRANCE

EASA

SUPPLEMENTAL TYPE CERTIFICATE

10071622

AIRBUS S.A.S.

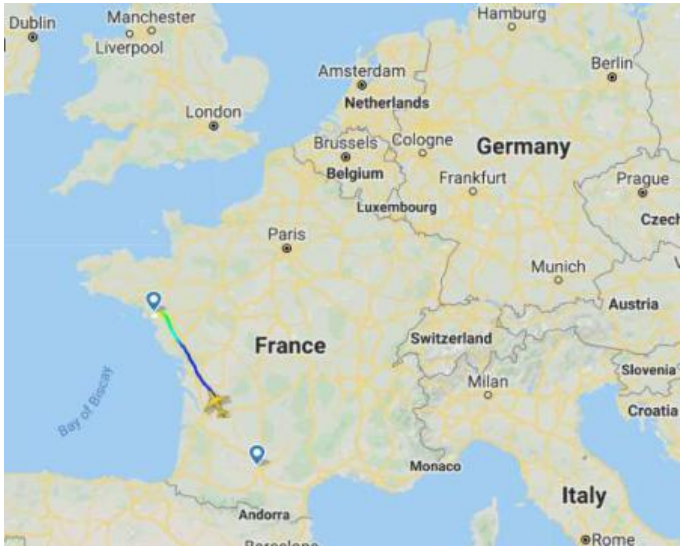
2 RONDPOINT EMILE DEWOITINE
31700 BLAGNAC
FRANCE

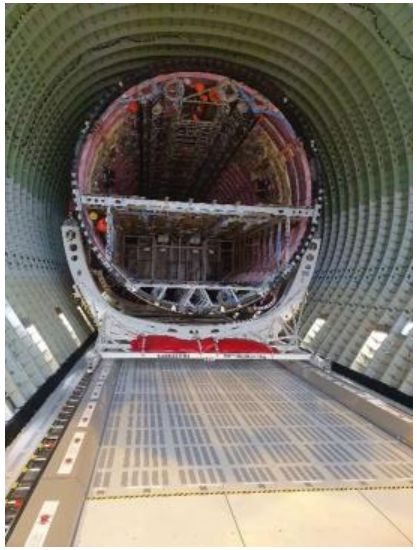
AIRCRAFT STATEMENT OF CONFORMITY

Delivery on 6th of December 2019

Adaptation of the overall system in parallel

In operation since the 9th of January 2020, in SNZ on 16th of January



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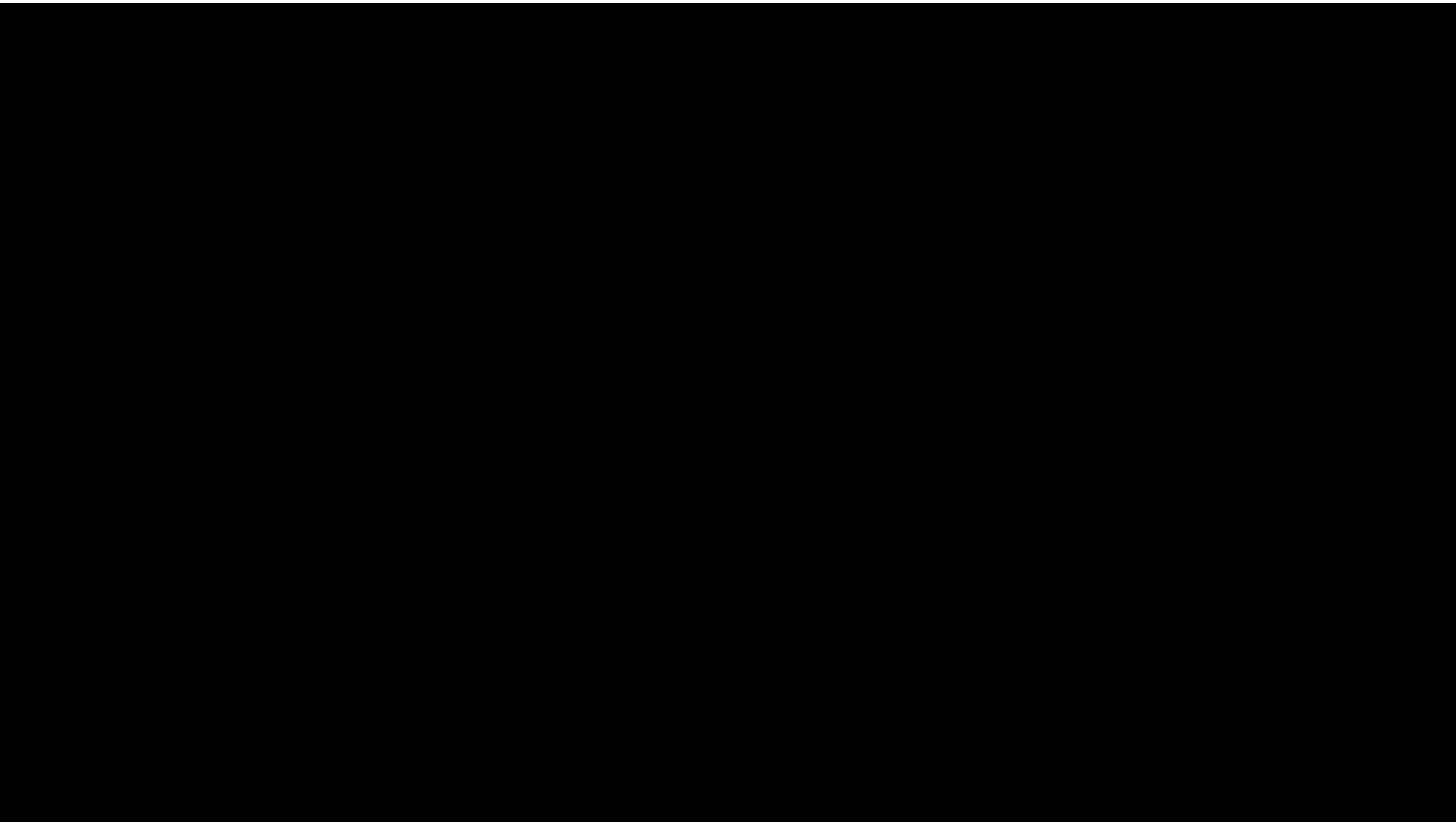
XL



Q & A

Thank you

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